

Translation

PATENT COOPERATION TREATY

PCT/DE2003/000580



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002P03682WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/000580	International filing date (day/month/year) 24 February 2003 (24.02.2003)	Priority date (day/month/year) 07 March 2002 (07.03.2002)
International Patent Classification (IPC) or national classification and IPC G01J 9/00		
Applicant SIEMENS AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 19 September 2003 (19.09.2003)	Date of completion of this report 15 July 2004 (15.07.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE2003/000580

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed☒ the description:

pages _____ 1,3-9 _____, as originally filed

pages _____, filed with the demand

pages _____ 2,2a,10,10a _____, filed with the letter of _____ 04 March 2003 (04.03.2003)

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages _____ 1-14 _____, filed with the letter of _____ 04 March 2003 (04.03.2003)

☒ the drawings:

pages _____ 1/4-4/4 _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☐ The amendments have resulted in the cancellation of:☐ the description, pages _____☐ the claims, Nos. _____☐ the drawings, sheets/fig _____5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE 03/00580

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations

1. The present application pertains to a method (claim 1) and a device (claim 7) for reducing spurious signals in an electro-optical measuring operation.

1.1 Claim 1 is based on the original claims 1 and 2.

1.2 Dependent claims 2-6 and 8-14 relate to advantageous embodiments of the method according to claim 1 and the device according to claim 7, respectively.

2. Prior Art

Reference is made to the following documents:

D1: BUXBAUM B ET AL.: "PMD-PLL: receiver structure for incoherent communication and ranging systems", OPTICAL WIRELESS COMMUNICATIONS II, BOSTON, MA, USA, 22 Sept. 1999, Vol. 3850, pages 116-127, XP009013591 Proceedings of the SPIE - The International Society for Optical Engineering, 1999, SPIE-Int.Soc.Opt.Eng., USA
ISSN: 0277-786X

D2: IWAI T ET AL.: "SPECKLE REDUCTION IN COHERENT

INFORMATION PROCESSING", PROCEEDINGS OF THE
IEEE, IEEE, NEW YORK, US, Vol. 84, No. 5, 1 May
1996 (1996-05-01), pages 765-781, XP000591804
ISSN: 0018-9219

D3: DE 197 04 496 A

D4: WANG L ET AL.: "SPECKLE REDUCTION IN LASER
PROJECTION SYSTEMS BY DIFFRACTIVE OPTICAL
ELEMENTS", APPLIED OPTICS, OPTICAL SOCIETY OF
AMERICA, WASHINGTON, US, Vol. 37, NO. 10, 1
April 1998 (1998-04-01), pages 1770-1775,
XP000754330 ISSN: 003-6935

D5: EP-A-0 997 762

D6: DE 196 16 863 A

a.) D1 (fig. 1, 6, 8; page 122, §2; page 124, §1 to
page 125, §2) discloses an electro-optical
mixing device - for example for distance
measurement - with a light source (e.g. laser or
LED - see especially fig. 8) and a light-
receiving unit (PMD).

b.) D2 describes the use of coherence-reducing means
with laser illumination, for example a rotating
multimodal fiber (page 768, §3A), for reducing
spurious signals (speckle reduction).

c.) The other documents cited also relate to
electro-optical devices or means of reducing
the coherence of laser beams.

3. Novelty

The claimed method (claim 1) and device (claim 7)
differ from the prior art according to the system
disclosed in D1 in that the coherence of the laser

beam is reduced before incidence on a light-receiving unit.

Claims 1 and 7 as well as their dependent claims 2-6 and 8-14 thus meet the requirement of novelty (PCT Article 33(2)).

4. Inventive Step

a.) The subject of claim 7 differs from the system disclosed in document D1 in that a coherence-reducing unit is connected upstream of the light-receiving unit.

The problem to be solved with the present invention can thus be seen as that of illuminating the light-receiving unit as homogeneously as possible and thus improving signal quality.

In D1 (page 122, §2) it is explicitly pointed out that preferably incoherent light should be used, and so without being inventive a person skilled in the art would take coherence-reducing means such as a rotating multimodal fiber (D2, page 768, §3A) into account when using laser light sources in light mixing devices. The subject of claim 7 therefore does not involve an inventive step (PCT Article 33(3)).

b.) Independent claim 1 pertains to a method of reducing spurious signals which conforms with the mixing device described in claim 7 and contains no additional features. Claim 1 is therefore - *mutatis mutandis* - not inventive.

c.) Dependent Claims

Dependent claims 2-6 and 8-14 do not contain any features which in combination with the features of any claim to which they refer back meet the PCT requirements in regard to inventive step. The reasons therefor are as follows:

Claims 2-6,

8-12, 14: The subjects of claims 2-6, 8-12 and 14 pertain to various conventional methods of reducing the coherence of a laser beam (see e.g. D4 (abstract; page 1770, §2); D5 (abstract; §§32, 35, 53, 64, 73); D6 (abstract)) and thus cannot be regarded as inventive.

Claim 13: Dependent claim 13 concerns a minor structural modification of the device according to claim 8 (i.e. integration of the light-receiving unit, the electro-optical mixer and the diffraction unit in one housing) that falls within the scope of what a person skilled in the art routinely does on the basis of familiar considerations.